An Overview of WSDOT's Linear Referencing System

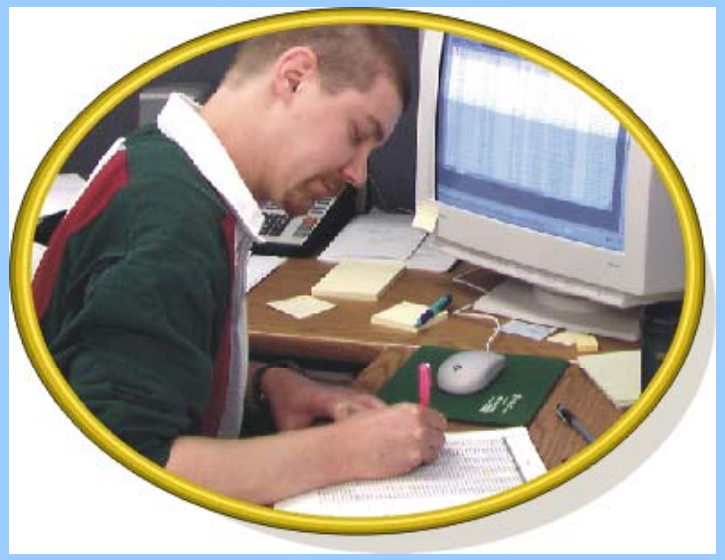
Washington State
Department of Transportation

Linear Referencing Methods

- a way to identify a specific location with respect to a known point
- methods used include milepost, accumulated route mileage, geographic coordinates, or GPS coordinates
- the common methods used in WSDOT are based on state route milepost (SRMP) and accumulated route mileage (ARM)

A Linear Referencing System (LRS) is...

- the set of field and office procedures that builds and maintains one or more linear referencing methods



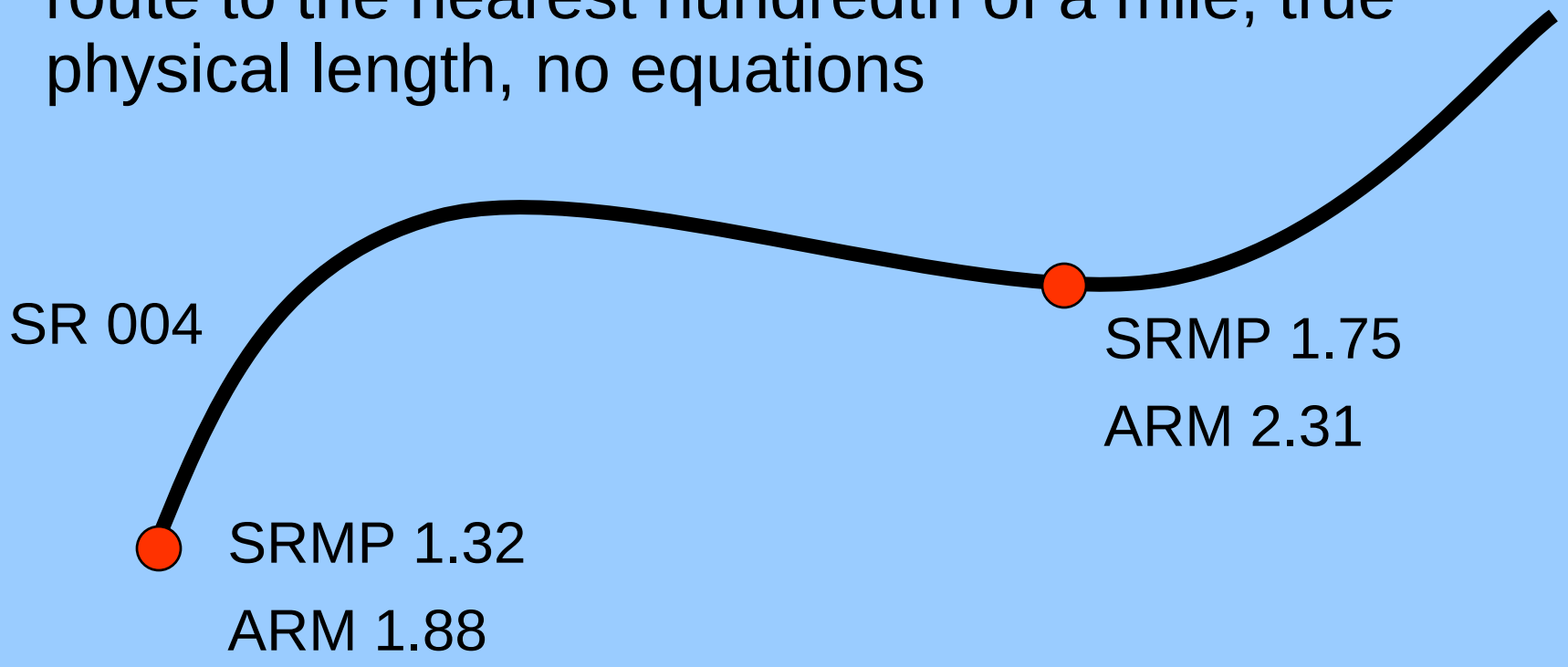
Current LRS

- Method used in TRIPS/TARIS to locate state route features, accidents and traffic volumes
- Based on Accumulated Route Mileage (ARM), State Route Milepost (SRMP) and effective date

Components of WSDOT Linear Referencing System

- State Route (SR) Number
- State Route Milepost (SRMP)
- Accumulated Route Mileage (ARM)
- SRMP / ARM / GPS Interchangeable
- Direction of Inventory
- Left/Right Indicator
- State Route Back Mileage
- Equation (Back, Gap or Physical Gap)
- Coincident Mileage
- Related Roadway Type (RRT)
- Related Roadway Qualifier (RRQ)

- SR Number - identified by three digit number (004)
- SRMP – based on milepost markers; assigns a logical value to a given point along a route to the nearest hundredth of a mile (1.32); length adjusted with equations
- ARM - accrual of mileage from beginning to end of route to the nearest hundredth of a mile; true physical length, no equations



SRMP versus ARM

- If the highway has undergone any changes in length or alignment, then the SRMP and the ARM will not be equal
- Whenever a change occurs, the ARM is adjusted in TRIPS to reflect the current physical length of the entire highway, while the SRMP is adjusted only at specific locations by the use of equations

Related Roadway Type (RRT)

- Two character abbreviation used to identify portions of the State Route system other than the main traveled way
- Includes categories for alternate routes, couplets, spurs, frontage roads, on/off ramps, collector-distributors, interchange crossroads, reversible lanes, roundabouts and ferry terminals
- Examples include AR, CO, SP, LX, RL, FT

Related Roadway Qualifier (RRQ)

- Six character field which is combined with the RRT to further locate it to a specific area
- RRQ can be based on: (1) a descriptive location, such as the name of a street or city; or (2) the mainline SRMP at the point where the RRT begins or attaches to the mainline

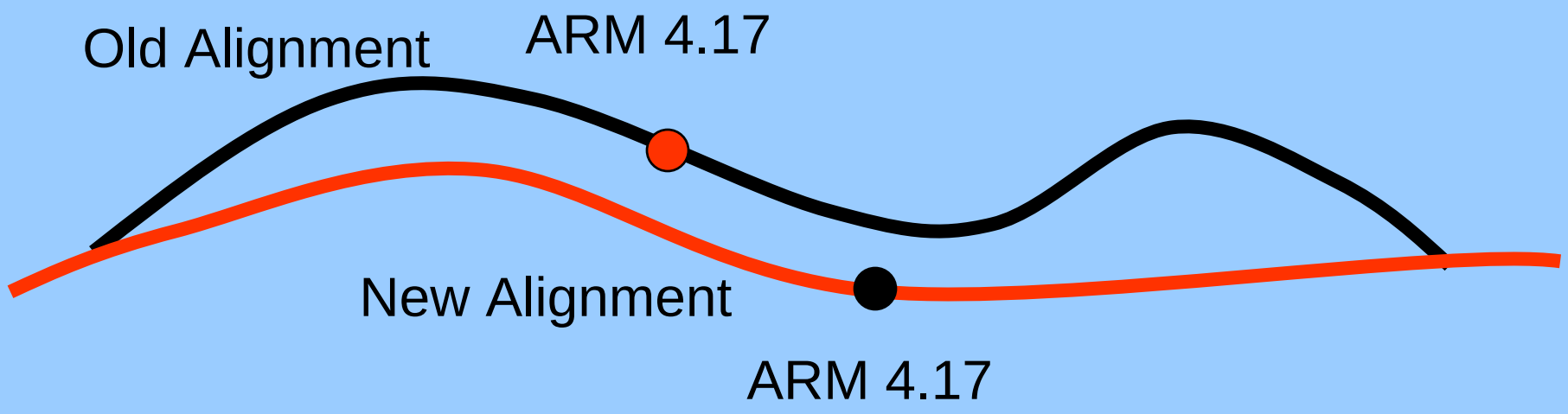
SR # + RRT + RRQ and effective date is the LRS's key which uniquely identifies each portion of the SR system:

- 101 CO ABERDN = SR 101 Couplet in Aberdeen
- 097 AR = SR 97 Alternate Route
- 090 Q1 27254 = SR 90 On Ramp on increasing milepost side of mainline, ending at SRMP 272.54

To have valid LRS values, users must:

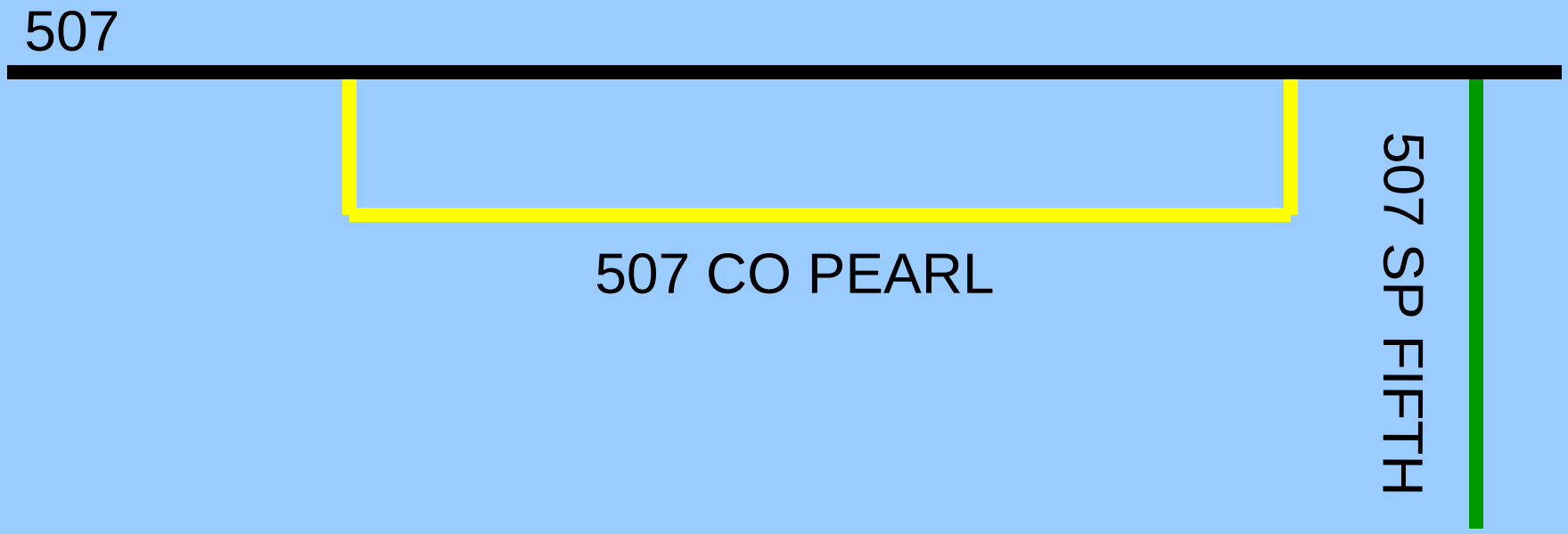
- Update any subject databases when TRIPS updates the LRS
- Include the entire LRS key of State Route # + RRT + RRQ in initial data gathering

Problem: Outdated LRS



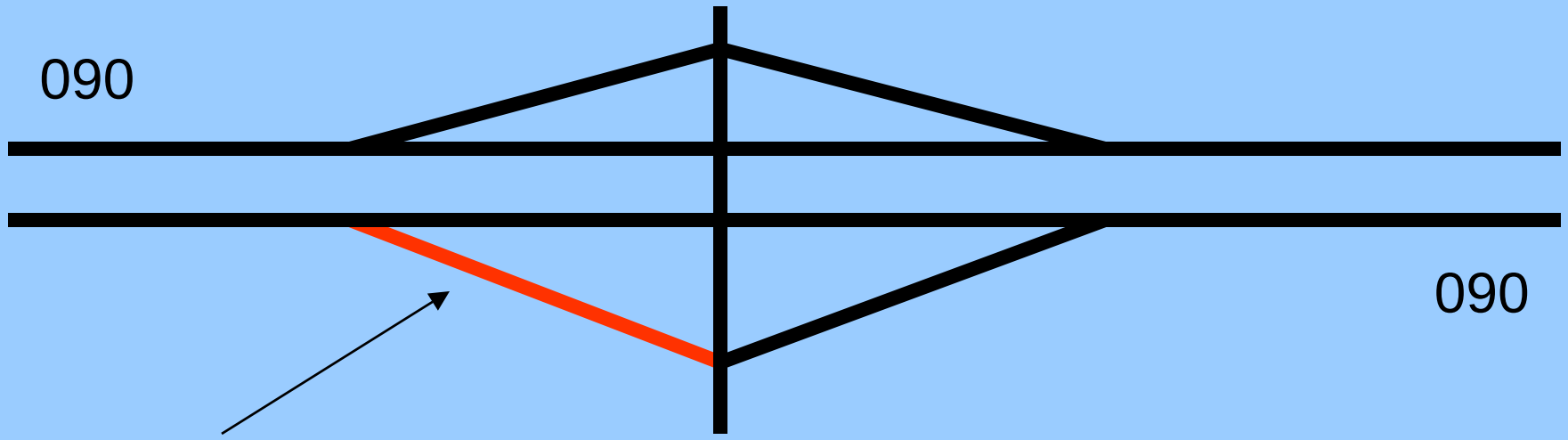
Due to a change in the highway's alignment, if user fails to update their database with the most current LRS, they will be at the wrong location

Problem: Incomplete LRS Key



Without the complete LRS key, the desired roadway cannot be correctly identified

Problem: Lack of LRS Synchronization



090 P1 22345 changed to 090 P1 22338, effective 12/17/2000

Unless all LRS values are synchronized to the same date, databases cannot be linked correctly

To prevent these problems, users must ensure that any subject databases are kept in sync with TRIPS through the use of such tools as the TRIPS ARM Calculation Module